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EXAMINER	
GORDON, CARLENE MICHELLE	
ART UNIT	**PAPER NUMBER**
2124	

DATE MAILED: 08/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/939,310	SOKOLOV, STEPAN	
	Examiner	Art Unit	
	Carlene Gordon	2124	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 August 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2/19/02, 3/17/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to the application filed on August 24, 2001.

Claims 1-21 are pending in the application.

Drawings

2. Figure 1A should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. 37 CFR 1.84(p)(5) states:

> (5) Reference characters not mentioned in the description shall not appear in the drawings. Reference characters mentioned in the description must appear in the drawings.

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

Fig. 2B, reference numbers 220 and 232.

Corrected drawing sheets, or amendment to the specification to add the reference character(s) in the description, are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5. The drawings are objected to under 37 CFR 1.83(a) because they fail to show an arrow in Figure 9B designating the flow of the instructions 920 to the instruction generator 902 as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement

sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 1-15 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. A simple amendment will overcome this rejection.

The language of claims 1and 9 raise a question as to whether the claims are directed merely to an abstract idea that is not tied to a technological machine which would result in a practical application producing a concrete, useful, and tangible result to form the basis of statutory subject matter under 35 U.S.C. 101. The Office interprets the invention of the claims as an abstract idea.

Claims 2-8, and 10-15 are rejected under the same rationale as claims 1 and 9 because they are dependent claims of claims 1 and 9, respectively.

Claim 1:

In a Java computing environment, a Java macro instruction **on a computer readable medium** representing:

a sequence of Java Bytecode instructions consisting of a Java instantiation Bytecode instruction immediately followed by a Java Duplicate the stack Bytecode instruction,

wherein said Java macro instruction can be executed by a Java virtual machine operating in said Java computing environment, and

wherein, when said Java macro instruction is executed, the operations that are performed by said conventional sequence of Java Bytecode instructions are performed.

Claim 9:

In a Java computing environment, a Java macro instruction **on a computer readable medium** representing:

a sequence of Java Bytecode instructions consisting of an inventive Java New Bytecode instruction immediately followed by an inventive Java Dup Bytecode instruction,

wherein said Java macro instruction can be executed by a Java virtual machine operating in said Java computing environment, and

wherein, when said Java macro instruction is executed, the operations that are performed by said sequence of Java Bytecode instructions are performed.

8. To expedite a complete examination of the instant application the claims rejected under 35 U.S.C. 101 (nonstatutory) above are further rejected as set forth below in anticipation of applicant amending these claims to place them within the four statutory categories of invention.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

11. Claim 1 recites the limitation "said conventional sequence" in claim 1, line10. There is insufficient antecedent basis for this limitation in the claim.

Claims 2-8 are rejected because they are dependent claims of claim1, ad do not overcome the deficiencies of claim 1.

Claim 3 recites the limitation "the Java Bytecode verification phase" in claim 3, line19. There is insufficient antecedent basis for this limitation in the claim.

The limitations "A Java macro instruction" in claims 2-8 and 10-15, and "A computer readable media" in claims 17-21 in unclear as to whether or not these elements refer to the "instruction " and "media" in base claims 1, 9, and 16.

12. The term "inventive" in claims 9 and 16 is a relative term that renders the claims indefinite. The term "inventive" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The "inventive Java New Bytecode instruction" and the "inventive Java Dup Bytecode instruction" are rendered indefinite by the use of the term "inventive". For the purpose of interpreting the claims in order to review applicable prior art, the Examiner interprets the "inventive Java New Bytecode instruction" and "inventive Java Dup Bytecode instruction" as conventional new and dup instructions. The interpretations do not afford distinction from the conventional instantiation instructions or Duplicate the stack instructions.

13. The following is a quotation of the fourth paragraph of 35 U.S.C. 112:

> Subject to the following paragraph, a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

14. Claim 2 is rejected under 35 U.S.C. 112, fourth paragraph, as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 2 recites the limitation, "Java macro instruction consists of a *conventional* Java instantiation Bytecode instruction immediately followed by a *conventional* Java Duplicate the stack Bytecode instruction" (emphasis added). The Office acknowledges the difference in wordings of claim 1 and claim 2 by the placement of the word "conventional" as in claims 2; however, from the claim language and written description, the Office is not able to determine the difference in scope of claims 1 and 2, as to how "conventional" Java instantiation Bytecode and Java Duplicate the stack Bytecode instructions are different from "Java instantiation Bytecode" and "Java Duplicate the stack Bytecode" instructions of claim 1.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

16. Claims 1-3, 9, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cirne (U.S. Patent No. 6,260,187), hereafter "**Cirne**", and further in view of Goss et al. (U.S. Patent No. 4,667,290), hereafter "**Goss**".

17. **As to claim 1:**

Cirne discloses a sequence of Java Bytecode instructions consisting of a Java instantiation Bytecode instruction immediately followed by a Java Duplicate the stack Bytecode instruction (col. 14, lines 31-32 "new...dup"),

Cirne discloses wherein said Java instruction can be executed by a Java virtual machine operating in said Java computing environment (col. 14, lines 6-10, "instruction set for Java Virtual Machine"). Cirne does not explicitly disclose that the Java instruction is a macro, and that when said Java macro instruction is executed, the operations that are performed by said conventional sequence of Java Bytecode instructions are performed.

However, Goss discloses a macro that replaces sections of code, where calls to this subroutine would perform the same function (col. 24, lines 25-35, "Macro ... subroutine... same function.").

One of ordinary skill in the art at the time of the applicant's invention would have been motivated to combine the inventions of Cirne and Goss to create a macro as disclosed by Goss that replaces the repeated sequence of bytecode instructions as clearly taught by Cirne. One of ordinary skill would have been motivated to replace this sequence, because it is a sequence that is common among Java bytecode instructions as taught by Cirne (col. 12, lines 41-42 "Sometimes new is followed with dup...") Furthermore, Cirne discloses this sequence of instructions being repeated in a single Java program (col. 14). Goss further teaches creating a macro as an optimization technique more thorough than Hoisting and Sinking for removing repeated sections of code (col. 24, lines 26-28; col. 21, lines 37-46). Therefore, it would have been obvious

to one of ordinary skill in the art at the time of the inventions to better optimize the code taught by Cirne with a technique of macro compression as taught by Goss to provide code with the same functionality but smaller.

18. **As to claim 2:**

Rejection of claim 1 is incorporated, and further, the term "conventional" is interpreted as "based on general practice", and the instructions as disclosed by Cirne are conventional.

19. **As to claim 3:**

Rejection of claim 1 is incorporated, and further in the method disclosed by Cirne and modified by Goss, the Java macro is generated during the Java Bytecode verification phase, wherein the bytecode will be verified (checked for the sequence of instructions) to create the Java macro instruction.

20. **As to claim 9:**

Claim 9 recites limitations already discussed in connection with claim 1 therefore; claim 9 is rejected under the same rationale as claim 1. For purposes of examination the term an "inventive macro instruction" is interpreted as a macro instruction.

21. **As to claim 16:**

The limitations of claim 16 have already been addressed in connection with claim 9 above.

22. Claims 4-8 rejected under 35 U.S.C. 103(a) as being unpatentable over Cirne and Goss as applied to claim 1 above, and further in view of Augusteijn et al. (U. S. Patent No. 6,292,883), hereafter "**Augusteijn**".

23. **As to claim 4:**

Rejection of claim 1 is incorporated, and further Cirne does not explicitly teach wherein said Java virtual machine internally represents Java instructions as a pair of streams. However, Augusteijn teaches virtual machine instructions represented as a pair of streams (col. 7, lines 1-5, "Harvard architecture").

Augusteijn, Cirne, and Goss are analogous art because each teaches modification and/or transformation of code, in particular, as in Augusteijn and Cirne, virtual machine code. One of ordinary skill in the art at the time of the invention would have known of the Harvard architecture which separates the instructions (commands or opcodes) from the data (operands) as taught by Augusteijn; and would have been motivated to combine this with the invention of Cirne and Goss to represent code as segregated from data in the java virtual machine instruction of Cirne in order to make the virtual machine more efficient and faster by bypassing the step of having to extract the code from the data.

24. **As to claim 5:**

Rejection of claim 4 is incorporated, wherein Augustine said pair of streams includes a code (col. 7, line 5 "instructions") stream and a data (col. 7, line 5 "data") stream,

wherein said code stream is suitable for containing a code portion ("instructions" are interpreted as code or commands) of said Java macro instruction, and

wherein said data stream is suitable for containing a data portion of said Java macro instruction ("data").

25. **As to claim 6:**

Rejection of claim 5 is incorporated, and further Goss discloses wherein said Java macro instruction is generated only when said virtual machine determines that said Java macro instruction should replace said conventional sequence (col. 24, line 28-32, "Macro compression catches repeated sections").

26. **As to claim 7:**

Rejection of claim 6 is incorporated, and further Goss discloses wherein said determination is made based on a predetermined criteria (col. 24, line 27-28, "removing repeated sections of code").

27. **As to claim 8:**

Rejection of claim 7 is incorporated, and further Goss discloses wherein said

predetermined criteria is whether said conventional sequence has been repeated more than a predetermined number of times (col. 24, lines 25-32, Goss implicitly discloses that the predetermined number of times is zero).

28. Claims 10-15, and 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cirne and Goss as applied to claims 9 and 16 above, and further in view of Meyer et al. (Java Virtual Machine), hereafter "**Meyer**".

29. **As to claim 10:**

Rejection of claim 9 is incorporated, and further Cirne discloses wherein said Java Dup Bytecode instruction represents a virtual machine instruction suitable for execution in a virtual machine to duplicate values stored in an execution stack on top of said execution stack (col. 12, lines 43-44, "dup... duplicates the top stack word").

Cirne does not explicitly disclose how this one instruction represents two or more conventional Java Bytecode executable instructions that are also suitable for duplicating values stored in the execution stack on top of the execution stack.

However, Meyer discloses two or more conventional Java Bytecode executable instructions that are also suitable for duplicating values stored in the execution stack on top of the execution stack (pg. 235-241, "dup, dup2, dup2_x1, dup2_x2, dup_x1, dup_x2", all duplicate top of stack) any of which may be represented by the "Java Dup" instruction as claimed.

One of ordinary skill in the art at the time of the applicant's invention would have been motivated to combine the disclosure of Meyer with the teachings of Cirne to allow the duplication of more than just the very top value on the stack, but also the top 2 values on the stack. This enhancement would have been obvious to one of ordinary skill in the art at the time of the applicant's invention given these instructions are all well known, i.e. commonly used, in the art as concluded from Meyer's disclosure.

30. **As to claim 11:**

Rejection of claim 10 is incorporated, and further Meyer discloses wherein values that can be duplicated on the execution stack are not limited to values that are within the first, second, and third positions from the top of the stack (pg. 235-241, "dup, dup2, dup2_x1, dup2_x2, dup_x1, dup_x2", Meyer discloses duplicating the top word *or* the top two words, not the top one, two, and three words).

31. **As to claim 12:**

Rejection of claim 11 is incorporated, and further Meyer discloses wherein the values duplicated on top of the stack can be 4 byte values or 8 byte values (pg. 235-241, "dup, dup2, dup2_x1, dup2_x2, dup_x1, dup_x2", Either a single word value can be duplicated which is one integer (dup...) or two single-word values which is equivalent to two integers, a double, or a long (dup2...); pg. 46 Table 3-1: shows int – 32 bits (4 bytes) and double/long – 64 bits (8 bytes)) .

32. **As to claim 13:**

Rejection of claim 12 is incorporated, and further Meyer discloses wherein the virtual machine instruction has a parameter associated with it to indicate which value stored in the execution stack should be duplicated on the top of the stack (pg. 236 –237, "dup2" instruction has the parameter "2" associated with it to indicate which value stored in the execution stack should be duplicated on the top of the stack).

33. **As to claim 14:**

Rejection of claim 9 is incorporated, and further Cirne discloses that the Java New Bytecode instruction represents a virtual machine instruction suitable for execution in a virtual machine to instantiate Java objects (col. 11, lines 17-21, "new instruction is used create a new object").

Cirne does not disclose the virtual machine instruction representing two or more Java Bytecode executable instructions that are also suitable for instantiation of Java objects or arrays.

However, Meyer discloses two or more Java Bytecode executable instructions that are also suitable for instantiation of Java objects or arrays (pgs. 130, 132, "new, newarray, anewarray, multianewarray" all of which are instructions for creating arrays or objects) any of which may be represented by the "Java New" instruction as claimed.

One of ordinary skill in the art at the time of the applicant's invention would have been motivated to combine the disclosure of Meyer with the teachings of Cirne to allow for the creation of arrays and objects. These arrays could be arrays of numbers,

booleans, and objects. This enhancement would have been obvious to one of ordinary skill in the art at the time of the applicant's invention given these instructions are all well known, i.e. commonly used, in the art as concluded from Meyer's disclosure.

34. **As to claim 15:**

Rejection of claim 14 is incorporated, and further Meyer discloses wherein the instantiation of Java objects and arrays are performed by determining the type of the object or array based on a parameter that is associated with the object or array (pg. 130 "newarray int" "make an array of ... ints" –clearly shows a parameter value that indicates the type of array that will be instantiated), as it is interpreted from the applicant's specification "the Java Bytecode instructions for instantiation are typically followed by a parameter value that indicates the type" pg. 16 paragraph [0045].

35. **As to claim 17:**

Rejection of claim 16 is incorporated, and further see rejection of claim 10.

36. **As to claim 18:**

Rejection of claim 17 is incorporated, and further see rejection of claim 11.

37. **As to claim 19:**

Rejection of claim 17 is incorporated, and further see rejection of claim 13.

38. **As to claim 20:**

Rejection of claim 17 is incorporated, and further see rejection of claim 14.

39. **As to claim 21:**

Rejection of claim 20 is incorporated, and further see rejection of claim 15.

Conclusion

40. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tim Ritchey, Java!, 1995, New Riders Publishing, pgs. 326-343.

41. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carlene Gordon whose telephone number is (703) 605-4226. The examiner can normally be reached on Mon.-Fri. 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on (703) 305-9662. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C.G. /C.D.

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